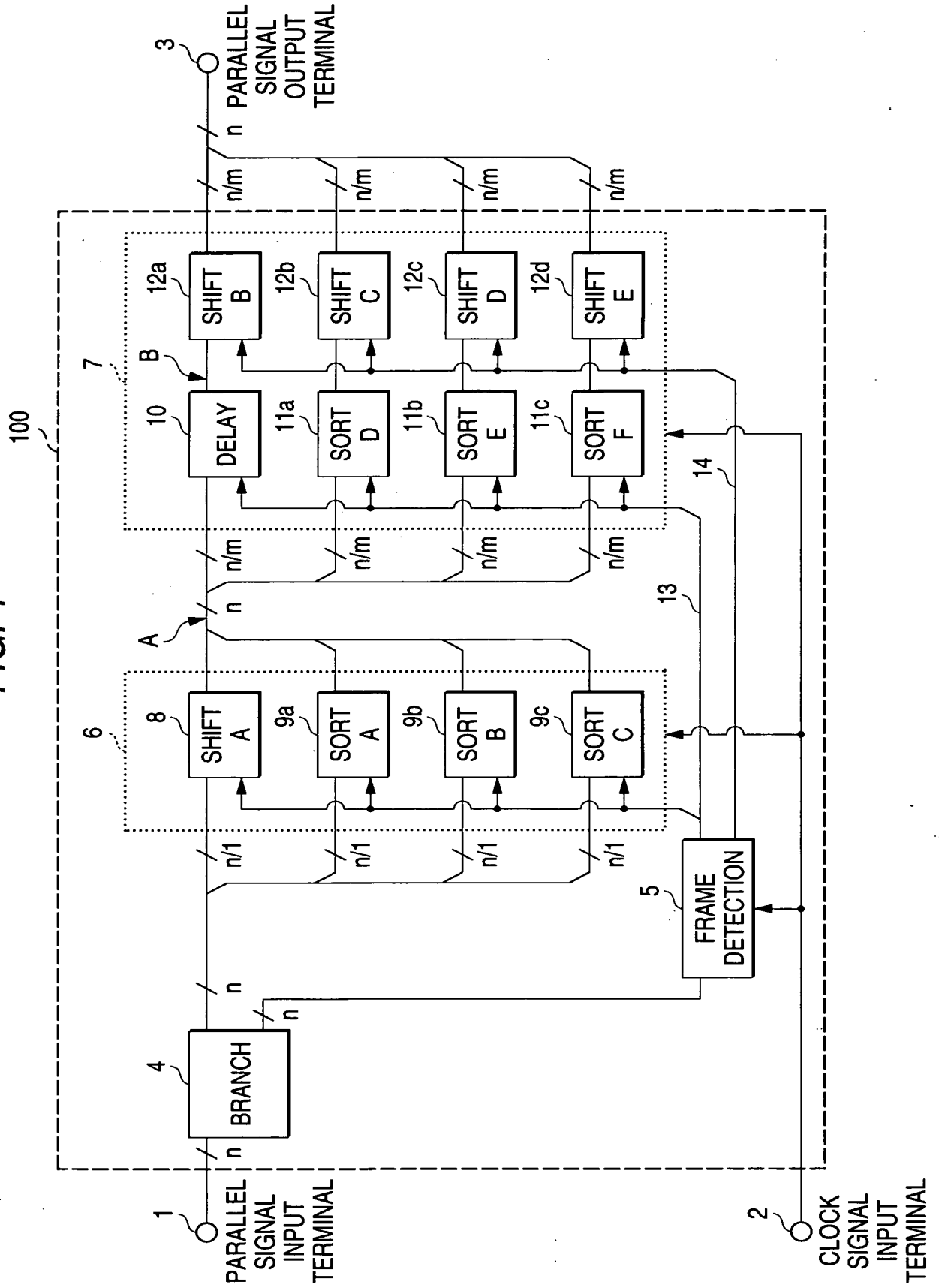


FIG. 1



**FIG. 2**

TRUTH TABLE OF SHIFT CIRCUITS A TO E  
(WHERE INPUT OF SORT CIRCUIT AND SHIFT CIRCUIT IS 4 BITS)

INPUT						OUTPUT			
D0	D1	D2	D3	SEL	CLK	Q0	Q1	Q2	Q3
A	B	C	D	0	↑	A	B	C	D
A	B	C	D	1	↑	B	C	D	A (+1)
A	B	C	D	2	↑	C	D	A (+1)	B (+1)
A	B	C	D	3	↑	D	A (+1)	B (+1)	C (+1)

**FIG. 3**

TRUTH TABLE OF SORT CIRCUITS A TO C  
(WHERE INPUT OF SORT CIRCUIT IS 4 BITS)

INPUT						OUTPUT			
D0	D1	D2	D3	SEL	CLK	Q0	Q1	Q2	Q3
A	B	C	D	0	↑	A	B	C	D
A	B	C	D	1	↑	B	C	D	A
A	B	C	D	2	↑	C	D	A	B
A	B	C	D	3	↑	D	A	B	C

**FIG. 4**

TRUTH TABLE OF SORT CIRCUITS D TO F IN ENABLE  
(WHERE INPUT OF 1 BIT SHIFT CIRCUIT IS 4 BITS)

INPUT					OUTPUT			
D0	D1	D2	D3	CLK	Q0	Q1	Q2	Q3
A	B	C	D	↑	B	C	D	A

FIG. 5A

DATA INPUT A

BIT0	x	j (-1)	x
BIT1	x	k (-1)	x
BIT2	x	l (-1)	x
BIT3	x	m (-1)	x
BIT4	x	n (-1)	x
BIT5	x	o (-1)	x
BIT6	x	p (-1)	x
BIT7	x	a	x
BIT8	x	b	x
		⋮	
BIT14	x	h	x
BIT15	x	i	x

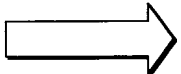
  
 LOW ORDER  
 BIT OF FRAME  
 POSITION SIGNAL

FIG. 5B

STATE DATA  
AT POINT A

x	m (-1)	x	SHIFT A OUTPUT
x	j	x	
x	k	x	
x	l	x	
x	m	x	SORT A OUTPUT
x	n (-1)	x	
x	o (-1)	x	
x	p (-1)	x	
x	e	x	
	⋮		
x	g	x	
x	h	x	

FIG. 6A

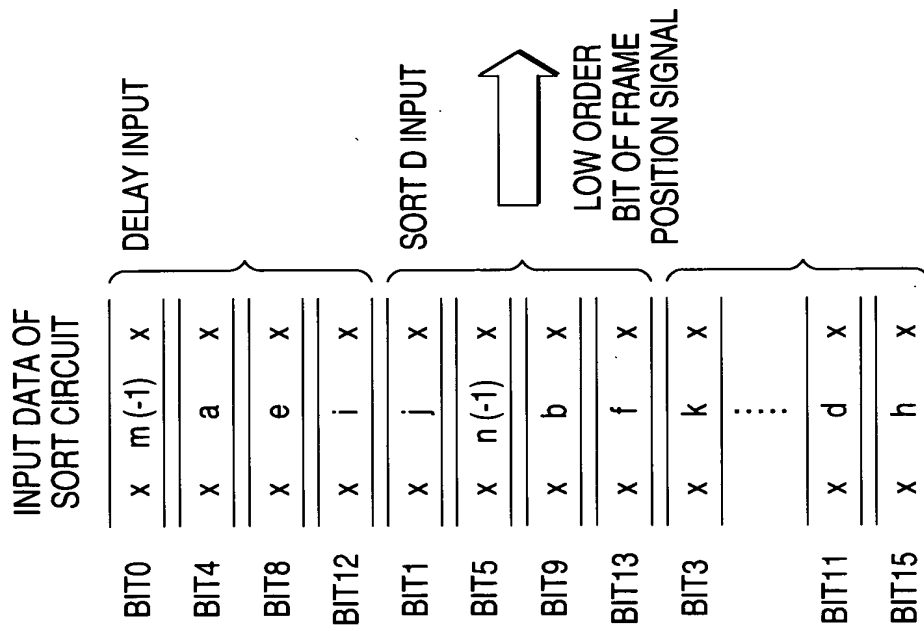


FIG. 6B

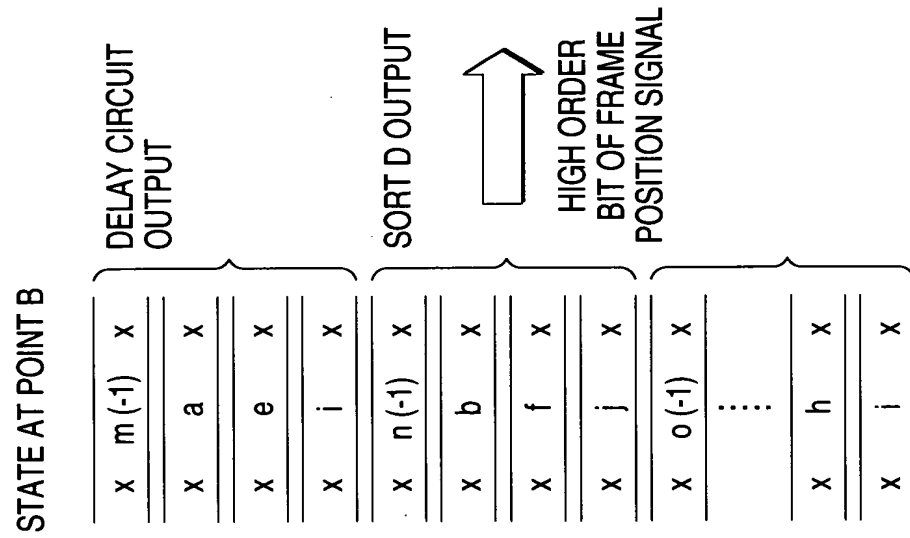


FIG. 6C

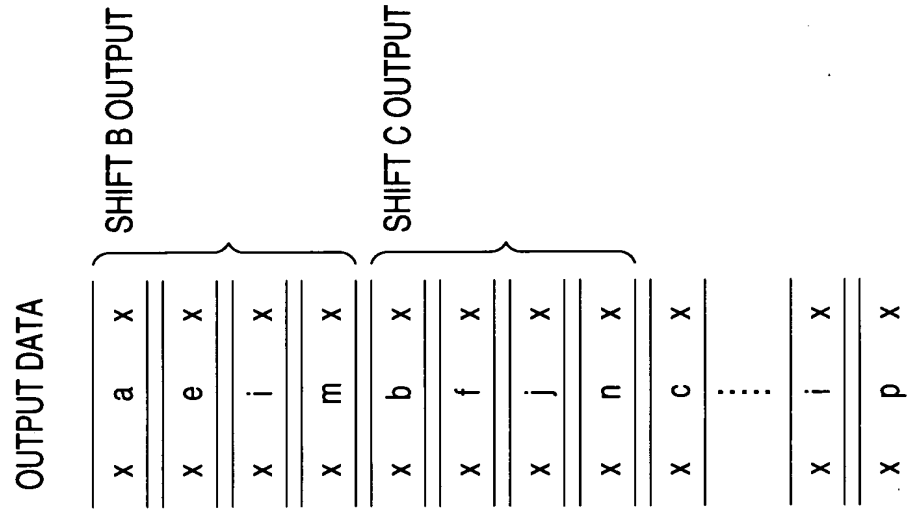
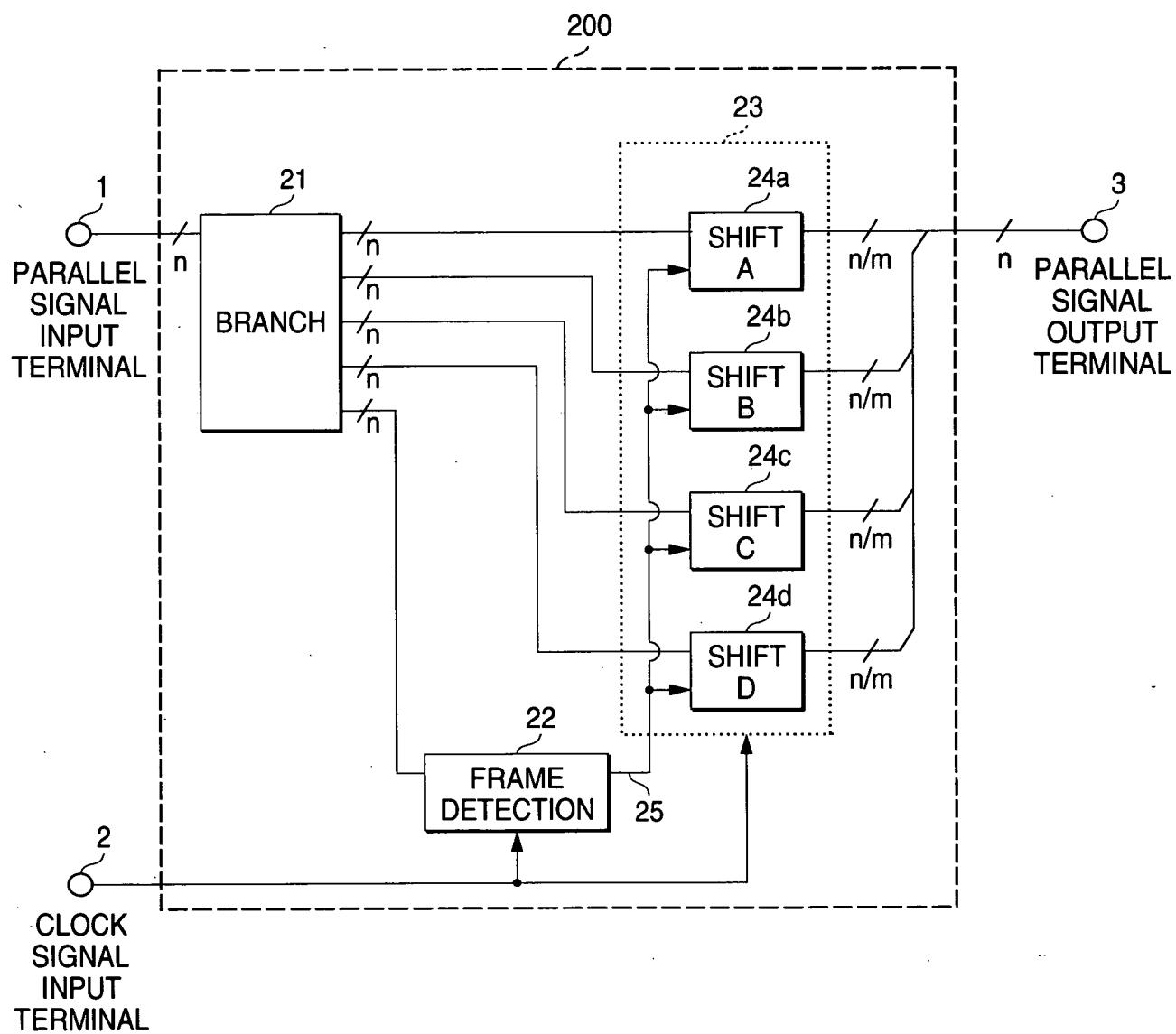


FIG. 7



*FIG. 8*

TRUTH TABLE OF SHIFT CIRCUIT A  
(WHERE DATA INPUT IS 16 BITS, AND THERE ARE FOUR SHIFT CIRCUITS)

INPUT							OUTPUT			
D0	D1	D2	...	D15	SEL	CLK	Q0	Q1	Q2	Q3
A	B	C	...	P	0	↑	A	B	C	D
A	B	C	...	P	1	↑	B	C	D	E
A	B	C	...	P	2	↑	C	D	E	F
A	B	C	...	P	...	↑	...	...	...	...
A	B	C	...	P	15	↑	P	A (+1)	B (+1)	C (+1)

*FIG. 9*

TRUTH TABLE OF SHIFT CIRCUIT B  
(WHERE DATA INPUT IS 16 BITS, AND THERE ARE FOUR SHIFT CIRCUITS)

INPUT							OUTPUT			
D0	D1	D2	...	D15	SEL	CLK	Q0	Q1	Q2	Q3
A	B	C	...	P	0	↑	E	F	G	H
A	B	C	...	P	1	↑	F	C	H	I
A	B	C	...	P	2	↑	C	H	I	J
A	B	C	...	P	...	↑	...	...	...	...
A	B	C	...	P	15	↑	D (+1)	E (+1)	F (+1)	G (+1)

FIG. 10A

DATA INPUT			
BIT0	x	j (-1)	x
BIT1	x	k (-1)	x
BIT2	x	l (-1)	x
BIT3	x	m (-1)	x
BIT4	x	n (-1)	x
BIT5	x	o (-1)	x
BIT6	x	p (-1)	x
BIT7	x	a	x
BIT8	x	b	x
		⋮	
BIT14	x	h	x
BIT15	x	i	x

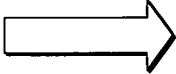
  
 FRAME  
 POSITION SIGNAL

FIG. 10B

DATA OUTPUT			
x	a	x	SHIFT A OUTPUT
x	b	x	
x	c	x	
x	d	x	
x	e	x	SHIFT B OUTPUT
x	f	x	
x	g	x	
x	h	x	
x	i	x	
	⋮		
x	o	x	
x	p	x	

FIG. 11

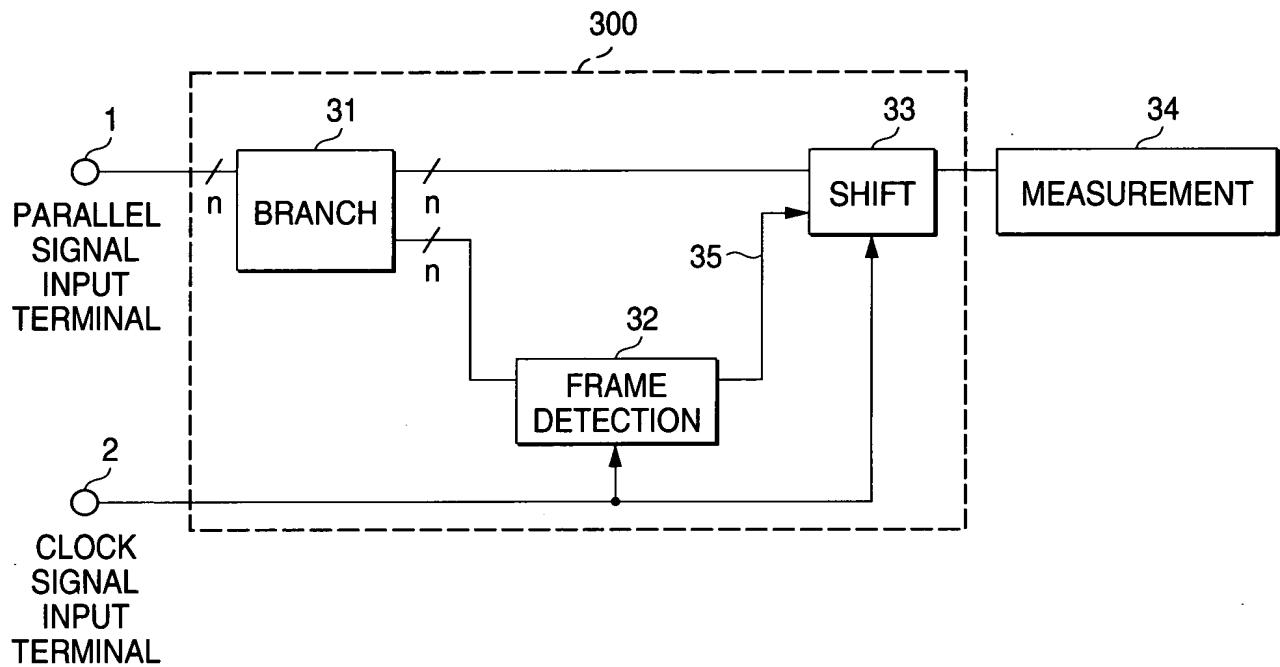


FIG. 12

TRUTH TABLE OF SHIFT CIRCUIT (WHERE DATA INPUT IS 16 BITS)

INPUT							OUTPUT				
D0	D1	D2	...	D15	SEL	CLK	Q0	Q1	Q2	...	Q3
A	B	C	...	P	0	↑	A	B	C	...	P
A	B	C	...	P	1	↑	B	C	D	...	A (+1)
A	B	C	...	P	2	↑	C	D	E	...	B (+1)
A	B	C	...	P	...	↑	...	...	...	...	...
A	B	C	...	P	15	↑	P	A (+1)	B (+1)	...	O (+1)